

# Testing Summit Sacramento, CA

November 28, 2005

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[www.vote.nist.gov](http://www.vote.nist.gov)

# **NIST “Help America Vote Act” Responsibilities**

- Chair Technical Guidelines Development Committee (TGDC)
- Provide technical support to TGDC in the development of voluntary voting system guidelines including:
  - Security
  - Methods to detect and prevent fraud
  - Human factors, including technologies for individuals with disabilities
- Accredite testing labs

# Who's Who in Federal Voting Guidelines?

- EAC – responsible for the guidelines
- TGDC – provide recommended guidelines to EAC
- Standards Board – give States' input to EAC
- Advisory Board – give advice to EAC
- NIST – provide technical assistance to TGDC

# Who's Who at NIST?

- NIST – measurements & standards
  - [www.nist.gov](http://www.nist.gov)
- Information Technology Lab
  - [www.itl.nist.gov](http://www.itl.nist.gov)
- National Voluntary Laboratory Accreditation Program
  - <http://ts.nist.gov/ts/htdocs/210/214/214.htm>

# NIST/TGDC Committee Structure & Coordination

- TGDC resolution (*July '04*) established 3 subcommittees to gather and analyze information:
  - Security and Transparency (STS)
  - Human Factors and Privacy (HFP)
  - Core Requirements and Testing (CRT)
- Each Subcommittees has NIST staff assigned to it.

## **NIST/TGDC Activities**

- July 2004: 1<sup>st</sup> plenary session of TGDC
- May 2005: Provided initial recommendations for voting system guidelines (VVSG)
- September 2005: Kicked off next round of technical guidance (VVSG 2)
- October 2005: Threat Analysis Workshop
- July 2007: Estimated completion for TGDC's work on VVSG 2.

## **Resolutions and NIST Work Products**

- TGDC plenaries are held to discuss issues, review work products and achieve consensus
- Major resolutions adopted at January TGDC Plenary requesting NIST to conduct research and draft standards
- 2 phase strategy adopted
- May 9 - Delivery to EAC of initial VVSG1
- September – kicked off VVSG 2

# Developing an Implementation Strategy

- First goal is to develop the best long-term guideline possible
  - Building on the strengths of the 2002 VSS
  - Changing areas that needed improvement
  - Reorganizing for clarity and testability
- Second goal is to meet HAVA deadlines for 2006 election cycle
  - Implies need to minimize changes to 2002 VSS
  - While also filling in 2002 VSS gaps
- Thus, two guidelines will be developed
  - An augmented 2002 VSS (VVSG)
  - A new redesigned voting system guideline (VVSG 2007)



# Voluntary Voting System Guideline

- Improves the 2002 VSS by addressing:
  - Human Factors
  - VVPAT,
  - Wireless,
  - Software Distribution and Setup Validation
  - Conformance, Glossary, Error Rates
- Sets stage for Redesigned Version
  - Human Factors
  - Independent Dual Verification

# VVSG 2007 Outline: Overview & Timeline

## Topics

- VVSG 2007 major changes
- New requirements format
- VVSG 2007 major organization
- Timeline

# Major Changes

- Restructured, precise requirements
- Improved organization, usable design
- Expanded requirements for human factors, security, core areas
- Requirements will reference their corresponding test methods or test cases

# New requirements format

- Numbered requirement text
  - TR: **test reference** to corresponding general test method/test case
  - P: any election official **procedures** necessary to accomplish requirement
  - D: **discussion** to clarify requirement

# VVSG 2007 Major Organization

1. Overview
  2. Terminology Standard
  3. Product Standard
  4. Standards on Data to be Provided Requirements
  5. Testing Standard
- Requirements in 3 and 4 reference general test methods/test cases found in 5

# Terminology Standard

- The basis for discussion in other major sections
- Provides common vocabulary for all terms and definitions
- Based on current voting systems glossary
- NIST will research current usage election-related terminology and combine with common language guidelines

# Product Standard

- Requirements for voting systems
  - Security
  - Human factors
  - Various core requirements
- Contains large sections with general requirements
- Contains requirements organized by voting system activity, e.g., pre-election, casting, counting



# Product Standard -- continued

1. Conformance clause
2. General requirements
  - Security
  - Human factors
  - Workmanship
  - Archival
  - Open standards
3. Requirements by voting activity
  - Preparing for election
  - Casting
  - Counting and reporting
  - IDV
4. Reference models
  - Process, logic, role model

# Standards on Data to be Provided

Affects vendors and VSTLs:

1. Technical data package - vendor
2. Voting equipment user documentation - vendor
3. Test report for EAC certification - VSTL
4. Public information package - VSTL
5. Information to be provided to NSRL – VSTL

# Testing Standard

- To assist VSTLs in using consistent testing techniques
- Contains high level general test methods and test cases, referenced by requirements as appropriate
- Full test suite not currently in timeline

# VVSG 2007

- The “final” deliverable of voting systems guidelines estimated for July, 2007
- A completely rewritten and reformatted guideline
- Will incorporate modules delivered to EAC prior to 7/07

# General Workplan

- TGDC working groups develop chapters
- Send to TGDC as a whole for comment
- TGDC provides formal guidance at meetings, but will have already had a chance to comment
- This will allow for faster development

# General Workplan

- Original research, e.g.,
  - Usability Performance Benchmarks
  - IDV
- Analysis
  - Apply security knowledge to voting
  - Apply accessibility and usability knowledge to IDV
- Review and outreach

# How Do You Contribute?

- Comment on posted drafts. All TGDC material is public. See [www.vote.nist.gov](http://www.vote.nist.gov).
- We read the comments.
- Send email to [voting@nist.gov](mailto:voting@nist.gov)
- States are represented on the TGDC via the Standards Board, but feel free to comment to us directly too.

# Test Labs

- ITAs will become VSTLs (Voting System Testing Labs)
- NVLAP will accredit them according to international laboratory accreditation procedures (ISO 17025)
- EAC will accredit them for testing voting systems



# Test Labs and States

- Can NVLAP accredit State labs?
  - Yes.
- What does NVLAP accreditation mean?
  - NVLAP provides an unbiased third-party evaluation and recognition of performance.
- Is NVLAP tied to a business model where the vendor pays?
  - No.

# Testing Business Models

- Vendor tests and pays (self-testing)
- Vendor pays (current ITA model)
- Purchaser pays (GA pays Kennesaw State)
- Government or Consortium pays (What if the EAC paid for ITA testing?)

# Threat Workshop

October 7, 2005

# Threat Modeling

- Everyone agreed we need a REAL threat analysis
- And it will be public
  - Comp: National Vulnerability Database
- It should help drive the standards process

# Threat Questions

- Is the threat plausible?
- How difficult/easy?
  - What would it take to make an attack successful?
- What countermeasures could apply?
- What damage could occur?
  - How big a risk is it?

# Talked thru some threats

- Trojan Horse in DRE Application,
- DRE Misprogramming
- Optical Scan Configuration File
- Optical Scan Ballot Design
- Touch Screen Calibration
- Optical Scan Calibration Trojan Horse
- Poor usability
- Poor procedures

# Threat Workshop

- “Exotic” threats should be taken seriously and studied further
- “Mundane” threats are a bigger threat today and must be better addressed

# Threats and Testing

- Some threats are mitigated through better standards (equipment and procedural)
- Some through better testing
- And some through better monitoring

Prevent – Detect - Recover



# What Next on Threat?

- NIST will issue workshop report
- Brennan Center is working on a threat analysis
- NIST heard a mandate to continue this work

## NSRL

- Hashes for all major voting system products [www.nsrl.nist.gov/voting](http://www.nsrl.nist.gov/voting)
- What are hashes?
- What can they do for improving voting system integrity?
- What can't they do with current voting equipment?

# Questions?

- Email: [voting@nist.gov](mailto:voting@nist.gov)
- Website: [www.vote.nist.gov](http://www.vote.nist.gov)
- My email: [bguttman@nist.gov](mailto:bguttman@nist.gov)